Observations from the ERS1 Altimeter of the Circulation in the Alboran Sea

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Sea surface height measurements as derived from the ERS 1 altimeter from Jan. -Dec. 1992 were used to study the gyre-scale circulation in the Alboran Sea of the Mediterranean. This basin, which is at the entrance to the Mediterranean from the Straits of Gibraltar, is known for two anticyclonic gyres one in the western part of the basin and the other in the eastern part of the basin. Data from the ERS 1 altimeter was extracted in the area between 35"N to 38"N and -6° to O°. Atmospheric corrections, including the wet and dry troposphere, were applied. After removal of the RAPP mean sea surface a quadratic in the along-track direction between 20"N and 60"N was also applied to remove the orbit error. The along-track data was interpolated to a regular grid in space-time using a successive correction scheme. To include an entire repeat a 35-day e-folding time scale was applied in the spatial domain. These maps were created at a regularly spaced 10 day interval for 1992 and thus not independent from each other. The maps of sea level residual will be compared with SAR imagery and in-situ data in the given area. Initial results from an analysis using Complex Empirical Orthogonal Functions (CEOF) indicates that the first two modes account for 70% of the variance, The first CEOF appears to be associated with the variability of the Almeria_Oran Front, while the second CEOF appears to describe the variability of the two anticyclonic gyres. For both CEOFs the time scales approximate the semiannual period.

1. 1994 Ocean Sciences Meeting

2, 001325585

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5. (a) 11 Topex/Poseidon
(b) 4532 General Circulation
4520 Eddies and mesoscale processes
4556 Sea level variations

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8. VISA 4673850764895 exp. date 08/94

9. C

10. no

11. no